

**PATENT KOKAI [LAID-OPEN] PUBLICATION NUMBER: KOKAI 2000-277151
(P2000-277151A)**

[CLAIMS]

[CLAIM ITEM 1]

According to a lithium secondary battery that uses positive pole active substance shown with a composition formula of $\text{LiNi}_{1-x}\text{M}_x\text{O}_2$ (M: composed of 1 or more than 2 types of combination of elements selected from Ti, Mn, Co, Al, Mg, and Ga. $0 \leq x < 1$), application method of lithium secondary battery is characterized by the fact that is used at the range of charged capacity that is at the least 30% and at the most 100%.

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[CLAIMS]

[CLAIM ITEM 1]

According to a lithium secondary battery that is equipped with a positive pole, a negative pole having either substance that is capable of occlusion and discharge of lithium ion in electrochemical manner or lithium metal as active substance, and non-aqueous electrolytic solution, lithium secondary battery is characterized by the fact that said positive pole is shown with a composition formula of $\text{Li}_x\text{Mn}_{1-x}\text{Ni}_y\text{O}_2$ ($0.1 \leq x \leq 1.2$, $0.20 \leq y \leq 0.39$); and has manganese .nickel composite oxide that includes a powder form lithium showing a hexagonal structure.

[CLAIM ITEM 2]

The lithium secondary battery in accordance with claim item 1, wherein said manganese .nickel composite oxide that includes lithium is shown particularly with a composition formula of $\text{Li}_x\text{Mn}_{1-x}\text{Ni}_y\text{O}_2$ ($0.1 \leq x \leq 1.2$, $0.25 \leq y \leq 0.35$).

[CLAIM ITEM 3]

The lithium secondary battery in accordance with the claim item 1, wherein peak half width of X-ray diffraction on the lattice plane (104) sought on the composition of $x=1$ of said manganese .nickel composite oxide that includes lithium by using CuK α line as a line source is $0.16 \sim 0.40^\circ$.

[CLAIM ITEM 4]

The lithium secondary battery in accordance with the claim item 1, wherein median diameter of said manganese .nickel composite oxide that includes lithium is $6 \sim 30 \mu\text{m}$.

[CLAIM ITEM 5]

The lithium secondary battery in accordance with the claim item 1, wherein said manganese .nickel composite oxide that include lithium is a burnt [sintered] body of mixture of manganese .nickel composite hydroxide and lithium compound.